

Patent
Serial No. 10/691,555

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application and reflects the amendment of claims 1-3, 17-18 and 20, and the cancellation of claims 4-7, 13-16, 19 and 21-22.

Listing of Claims:

1. (Previously Presented) A process for cleaning metals comprising the steps of
(a) preparing an aqueous cleaning solution by combining a stabilized hydrogen peroxide solution with~~contacting a metal with an aqueous solution comprising hydrogen peroxide~~, at least one mineral acid and water;

wherein said stabilized hydrogen peroxide solution consists of: (i) hydrogen peroxide in an amount from about 20 to about 70 wt%, based on the entire hydrogen peroxide solution; (ii) at least one complexing agent selected from the group consisting of 1-hydroxyethylidene-1, 1-diphosphonic acid, salts and degradation products thereof in an amount from about 10 to about 60 wt% based on the amount of hydrogen peroxide; and (iii) water; and (iv) components other than (i) through (iii) in an amount from 0 up to about 10 wt%, based on the amount of hydrogen peroxide; and

wherein said cleaning solution comprises from about 0.5 to about 20 wt% hydrogen peroxide; and at least one compound selected from the group consisting of complexing agents based on phosphonic acids, salts and degradation products thereof in an amount from about 10 to about 60 wt% based on the amount of hydrogen peroxide, said solution having a pH of below 7

(b) contacting a metal with said cleaning solution; and

(b) cleaning said metal via said contacting step.

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2. (Currently Amended) A process as claimed in claim 1, wherein ~~the aqueous solution comprises at least one compound selected from the group consisting of said complexing agents based on phosphonic acids, salts and degradation products thereof~~ is in an amount from about 20 to about 50 wt% based on the amount of hydrogen peroxide present in said stabilized hydrogen peroxide solution.

3. (Currently Amended) A process as claimed in claim 2, wherein ~~the aqueous solution comprises at least one compound selected from the group consisting of said complexing agents based on phosphonic acids, salts and degradation products thereof~~ is in an amount from about 35 to about 45 wt% based on the amount of hydrogen peroxide present in said stabilized hydrogen peroxide solution.

4.-7. (Cancelled)

8. (Previously Presented) A process as claimed in claim 1, wherein the mineral acid comprises sulfuric acid.

9. (Previously Presented) A process as claimed in claim 8, wherein the sulfuric acid is present in an amount from about 0.5 to about 20 wt%.

10. (Original) A process as claimed in claim 1, wherein the cleaning solution comprises at least one surfactant.

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11. (Original) A process as claimed in claim 10, wherein the cleaning solution comprises at least one non-ionic surfactant.

12. (Original) A process as claimed in claim 1, wherein the metal is selected from the group consisting of aluminium, copper and steel.

13. - 16. (Cancelled)

17. (Currently Amended) A process as claimed in claim 1, wherein said aqueous cleaning solution has a pH of from about 0 to about ~~6~~ 7.

18. (Currently Amended) A process as claimed in claim 1, wherein said aqueous cleaning solution has a pH of from about 0.5 to about ~~5~~ 6.

19. (Cancelled)

20. (Currently Amended) A process as claimed in claim ~~13~~ 1, wherein said aqueous cleaning solution has a pH of from about 0.5 to about 5.

21.-22. (Cancelled)

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23. (Previously presented) A process for cleaning and passivating metals, comprising the steps of:

(a) providing an aqueous solution comprising:

hydrogen peroxide in an amount of from about 0.5 to about 20 wt%, at least one mineral acid, and at least one compound selected from the group consisting of complexing agents based on phosphonic acids, salts and degradation products thereof in an amount from about 10 to about 60 wt% based on the amount of hydrogen peroxide, the remainder being water; and

(b) contacting said metal with said solution for a time sufficient to effect cleaning and less than an amount of time to effect etching; and

(c) passivating said metal via said contacting step.

24. (Previously Resented) A process as claimed in claim 23, wherein said aqueous solution has a pH of from about 0 to about 6, and wherein the complexing agent is based on at least one compound selected from the group consisting of 1-hydroxyethylidene-1, 1-diphosphonic acid, salts and degradation products thereof.